Final Report

Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2012 1221-010

2013 - 2016

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FINANCIAL ACCOUNTABILITY

Expenditure of watershed improvement funds and total project funds

Iowa Watershed Improvement Review Board (WIRB) financial support enabled the Rathbun Land and Water Alliance to make substantial progress toward the accomplishment of planned goals for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2012.* Specifically, WIRB funding helped the Alliance and its partners, including cooperating landowners, install best management practices (BMPs) in the Chariton River #5, Chariton River #10, and Middle Wolf Creek #2 targeted sub-watersheds of the Rathbun Lake watershed that will achieve close to 50% of the project's priority land treatment goal. Even more importantly, these BMPs will result in a considerable reduction in the estimated annual sediment and phosphorus delivery from this land to Rathbun Lake and the lake's tributaries (43% and 58% of project goals respectively).

The Alliance expended Watershed Improvement Funds for project activities in accordance with the grant agreement. Please refer to the Summary of Watershed Improvement Funds Approved, Expended, and Balance in Table 1. A complete financial ledger for the term of the grant agreement accompanies this report.

Table 1
Summary of Watershed Improvement Funds Approved, Expended, and Balance

Grant Agreement Budget Line Item	Total Funds Approved ($)	Total Funds Approved - Amended ($)	Total Funds Expended ($)	Available Funds ($) [a]
Terraces	66,150.00	66,150.00	66,150.00	0.00
Grade Stabilization Structures	17,640.00	17,640.00	0.00	17,640.00
Water and Sediment Control Basins	9,000.00	9,000.00	5,112.33	3,887.67
Priority Land Conversion	5,000.00	5,000.00	0.00	5,000.00
Totals	97,790.00	97,790.00	71,262.33	26,527.67
Difference				26,527.67

[a] The Alliance, partners, and landowners expended close to 72% of the available Watershed Improvement Funds. Factors which led to the expenditure of less funds than available were the need for a project period longer than three years which would allow additional time to plan, design, and complete the installation of practices and the relatively low percentage contribution (14%) of Watershed Improvement Funds proposed in the original application and budget to share the cost of practices.

FINANCIAL ACCOUNTABILITY contd.

Funds and in-kind contributions provided by other Alliance partners in addition to the Iowa WIRB financial support were essential to the progress made toward accomplishing planned goals for the *Rathbun Lake Special Project: BMPs for Priority Land in Targeted Sub-Watersheds 2012.*

Alliance partners' financial and non-financial resources, including the Watershed Improvement Funds, were utilized for project activities as planned in the original application submitted to the Iowa WIRB. Please refer to the Summary of Total Project Funding in Table 2. A complete financial ledger for the term of the grant agreement accompanies this report.

Table 2
Summary of Total Project Funding

Funding Source	Cash		In-Kind Contributions		Total	
	Approved Application Budget ($)	Actual ($)	Approved Application Budget ($)	Actual ($)	Approved Application Budget ($)	Actual ($)[a, b]
WIRB	97,790.00	71,262.33	0.00	0.00	97,790.00	71,262.33
Landowners	167,525.00	78,996.44	0.00	0.00	167,525.00	78,996.44
DNR/DSC	225,580.00	67,676.60	211,860.00	211,860.00	437,440.00	279,536.60
NRCS	196,255.00	129,708.65	0.00	0.00	196,255.00	129,708.65
RRWA	13,360.00	0.00	0.00	0.00	13,360.00	0.00
Totals	700,510.00	347,644.02	211,860.00	211,860.00	912,370.00	559,504.02

Watershed Improvement Fund contribution: Approved application budget: 11%
Actual: 13%

[a] Even though the total budgeted amount of funds from the Iowa WIRB and other project partners was not expended as planned, it is important to note that partners will continue to work with landowners to apply BMPs in the targeted sub-watersheds beyond the end of this grant agreement's project period. Funds from partners' sources other than this WIRB grant will be used to share the cost of continuing to apply these practices with landowners.

[b] Funds available from the DNR, DSC, and NRCS were less than anticipated during the project period. As indicated, funds from these partners' programs will continue to be available to assist landowners with the installation of BMPs after the end of the project period. RRWA contributed funds and in-kind assistance for the project's GIS analysis, water quality monitoring, and watershed outreach activities. These funds were not included as specific dollar amounts in the original application, but rather identified as a footnote to the application budget.

ENVIRONMENTAL ACCOUNTABILITY

Water quality improvement practices applied and results achieved

The Alliance and its partners, with financial support from the Iowa WIRB, assisted landowners to apply BMPs for priority land in the Chariton River #5, Chariton River #10, and Middle Wolf Creek #2 targeted sub-watersheds of the Rathbun Lake watershed. The original project goal was to assist landowners to apply BMPs for 1,200 acres, at least 600 acres of which would be priority land. These BMPs would reduce the annual amounts of sediment and phosphorus that are carried in runoff from priority land and impair water quality in the lake and its tributaries by 1,800 tons and 6,000 pounds respectively. Table 3 presents a summary of the BMPs planned and applied.

Table 3
Summary of Practices and Activities [a, b]

Practice or Activity and Units	Approved Application Goal	Planned Practices and Activities	Percent Planned	Completed Practices and Activities	Percent Completion
Terraces (ft.)	70,000	53,454	76	35,493	51
Grade Stabilization Structures (no.)	8	5	63	3	38
Water / Sediment Control Basins (no.)	25	12	48	5	20
Structure – Debris Basin (no.)	1	0	0	0	0
Priority Land Conversaion (ac.)	100	0	0	0	0

[a] The need for a project period longer than three years to complete BMP application and landowner preference for in-field practices to support row crop production were the primary factors that resulted in fewer units of practices being installed than approved and planned. As mentioned, partners will continue to assist landowners to apply BMPs in the targeted sub-watersheds beyond the end of this agreement's project period.

[b] GIS analysis, water quality monitoring, and watershed outreach activities were completed as proposed in the application.

ENVIRONMENTAL ACCOUNTABILITY contd.

The BMPs installed and supporting activities completed resulted in the treatment of close to 380 acres, of which about 270 acres were priority land. The BMPs will reduce the delivery of sediment and phosphorus to Rathbun Lake and tributaries in the lake's watershed by an estimated 774 tons and 3,496 pounds per year respectively. Table 4 presents a summary of planned and achieved land treatment and water quality benefits.

Table 4
Summary of Land Treatment and Water Quality Benefits

Land Treatment, Water Quality Benefits, and Units	Approved Application Goal	Based on Planned Practices	Percent Based on Planned	Based on Completed Practices	Percent Based on Completed
Total Land Treated with BMPs (ac.)	1,200	708	59	380	31
Priority Land Treated with BMPs (ac.)	600	495	82	260	43
Reduced Annual Sediment Delivery (tn.)	1,800	1,445	80	774	43
Reduced Annual Phosphorus Delivery (lb.)	6,000	6,530	108	3,496	58

Mention should be made of the following factors that influenced the implementation of project activities and the achievement of project goals:

Effective Targeting of BMPs: As indicated, the Alliance and its partners, including cooperating landowners, made substantial progress toward the accomplishment of project goals for land treatment and water quality benefits. Noteworthy is the percentage reduction in sediment and phosphorus delivery achieved with less than anticipated BMP application in terms of acres treated. These water quality benefits realized reflect the impact of project activities carried out by staff and landowners which targeted the installation of BMPs for areas of priority land with relatively high rates of annual sediment and phosphorus delivery to Rathbun Lake and the lake's tributaries.

Impact of Project Length: The Alliance and partners found that proposed goals for BMP installation and land treatment were aggressive for the three-year project period. As mentioned, the Alliance and its other partners will continue to work with landowners on the planned application of BMPs for priority land in the three targeted sub-watersheds beyond the end of this grant agreement's project period. The Alliance will also continue to track and report progress in applying BMPs and the associated reduction in sediment and phosphorus delivery to Rathbun Lake. The Alliance can make these reports of future project accomplishments available to the Iowa WIRB.

ENVIRONMENTAL ACCOUNTABILITY contd.

Landowner BMP Preference: Relatively high prices for corn and soybeans in recent years have influenced BMP decisions by landowners in the Rathbun Lake watershed. Landowners have demonstrated a strong preference for in-field BMPs that support row crop production, i.e., terraces, as opposed to practices that may reduce row crop acres or support alternative land uses, i.e., debris basins, grade stabilization structures, and priority land conversion. As such, landowners in the targeted sub-watersheds worked primarily with project staff to apply BMPs such as terraces and were less interested in other practices that they did not consider directly supportive of row crop production.

Costs of BMPs: The cost of constructing structural practices such as terraces, grade stabilization structures, and water and sediment control basins increased during the three-year project period. As an example, the construction cost for terraces, the BMP most commonly applied by landowners, increased by more than 18% during this period from $6.30 per foot to an average of $7.45 per foot. Increased costs can limit landowners' ability to finance their portion of BMP installation and result in fewer practices applied with a given amount of financial support from other project partners.

Geographic information system (GIS) generated maps of the Chariton River #5, Chariton River #10, and Middle Wolf Creek #2 targeted sub-watersheds accompany this report. These maps present the results of GIS analysis performed to identify priority land. The maps also illustrate the locations of BMPs that have been planned and applied for priority land. In addition, the maps present the results of GIS analysis that evaluated the water quality benefits associated with BMPs applied in each of the targeted sub-watersheds, that is, the estimated reductions in annual sediment and phosphorus delivery to Rathbun Lake and its tributaries.

The Alliance and partners carried out water quality monitoring activities in Rathbun Lake and the lake's tributaries as planned during the project period. The program consisted of monthly and event sample collection from as many as 20 sites and analyses for sediment, nutrients, bacteria, and pesticides. Monitoring results are used to help identify water bodies in the Rathbun Lake watershed on Iowa's Section 303(d) List of Impaired Waters and to assess water bodies in the watershed as part of Iowa's 305(b) Water Quality Report. The Iowa DNR prepares an annual report that summarizes the findings of water quality monitoring activities in the lake and watershed. The Alliance can make copies of these reports available to the Iowa WIRB. The monitoring program is an effort that will be ongoing after the end of the project period. The Alliance and partners will continue to use monitoring results to assess water quality conditions in Rathbun Lake and its tributaries as well as to plan BMP application and evaluate, to the extent possible, the effectiveness of practices to protect and improve water quality.

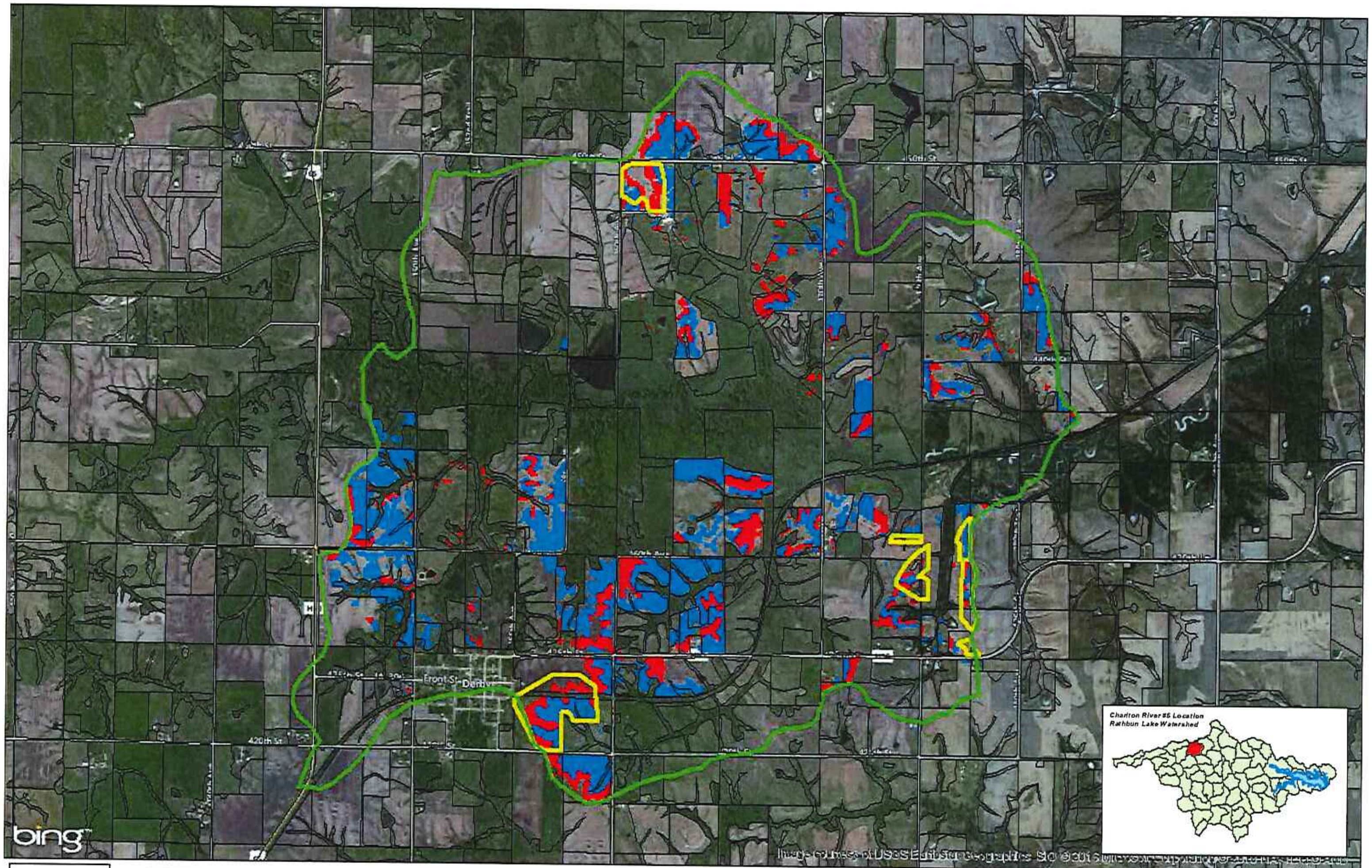
PROGRAM ACCOUNTABILITY

Activities to support the application of water quality improvement practices

Alliance members and partners completed the following activities in support of the application of BMPs for priority land in the Chariton River #5, Chariton River #10, and Middle Wolf Creek #2 targeted sub-watersheds and the achievement of associated reductions in annual sediment and phosphorus delivery to Rathbun Lake and the lake's tributaries:

- Assembled a team of expert advisors and field staff with Alliance members and partner organizations who were responsible for planning, implementing, and assessing the completion and impact of project activities;
- Developed and utilized a GIS-based methodology to identify the location of priority land in the targeted sub-watersheds, plan and track the application of BMPs, and estimate the water quality benefits associated with these practices;
- Provided one-on-one, on-farm, technical assistance to landowners who own and/or farm priority land in the targeted sub-watersheds which helped them evaluate, plan, and apply BMPs for this land;
- Completed activities of the *Rathbun Lake Protectors* watershed outreach program which included: (a) recognized landowners for their BMP application efforts as *Rathbun Lake Protectors* at the Alliance's annual *Protect Rathbun Lake* meetings; (b) coordinated interviews with landowners recognized as *Rathbun Lake Protectors* on WHO radio's daily farm show; (c) wrote feature articles that were published in Wallaces Farmer about landowners selected as *Rathbun Lake Protectors*; (d) installed and maintained *Rathbun Lake Protectors* on-farm signs and *Protect Rathbun Lake* roadside signs; (e) developed, exhibited, and presented project related displays and information at local and state events; (f) prepared and distributed a quarterly newsletter to Alliance members and partners; and (g) maintained the Alliance's Internet site at http://www.rlwa.org/ .
- Alliance's board of directors, partner representatives, and project team members regularly reviewed progress in the implementation of project activities and accomplishment of project goals. The Alliance prepared and submitted the required project plan of work, narrative reports, and financial ledgers.

Chariton River #5 Sub-Watershed
Priority Land Areas



Legend
- Watershed Boundary

Project Work Areas

Status
- Completed
- Planned
- Field Boundaries
- No Priority
- Priority
- High Priority
- Highest Priority

	Applied CY15	Applied Cumulative (FFY04-15)
Gross Erosion Before	406.0	505.0 Tons/yr.
Gross Erosion After	93.0	188.0 Tons/yr.
Gross Erosion Reduction	313.0	407.0 Tons/yr.
Sediment Delivery Before	169.0	295.0 Tons/yr.
Sediment Delivery After	5.0	11.0 Tons/yr.
Sediment Delivery Reduction	164.0	284.0 Tons/yr.
Phosphorus Delivery Before	1075.4	1669.0 lbs/year
Phosphorus Delivery After	28.5	62.1 lbs/year
Phosphorus Delivery Reduction	1046.9	1606.9 lbs/year
Total Acres Benefited	93.0	133.0 acres
Priority Acres Benefited	60	100 acres

Watershed Statistics (Completed + Planned)

Size: 5,995 Acres

Priority Acres: 770 Acres

Acres Benefiting: 133 Acres

Priority Acres Benefiting: 100 Acres

Approx. Sediment Del. Before Projects (Watershed): 5,875 Tons

Approx. Sediment Del. After Projects (Watershed): 5,591 Tons

Approx. Sediment Del. Reduction (Watershed): 284 Tons

Average Sediment Del. Reduction Per Acre: 2.14 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 33,486 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 31,879 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 1,607 Lbs.

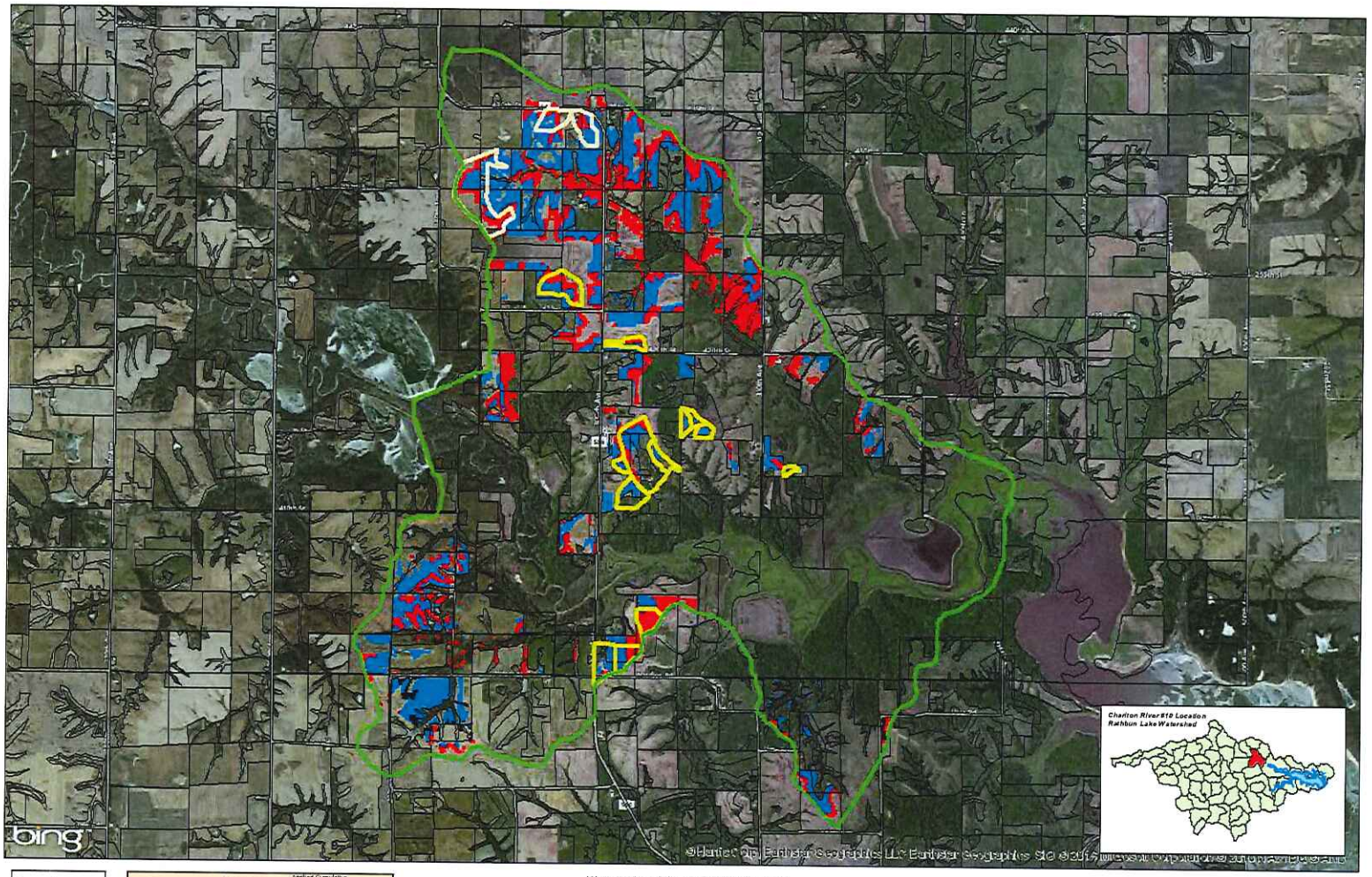
Average Phosphorus Del. Reduction Per Acre: 12.08 Lbs./Acre

0 0.125 0.25 0.5 Miles

Source: Rathbun Land and Water Alliance
IDALS DSC
Bing Maps
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association

Chariton River #10 Sub-Watershed
Priority Land Areas



Legend
- Watershed Boundary
- Project Work Areas
- Status
  - Completed
  - Planned
- Field Boundaries
- No Priority
- Priority
- High Priority
- Highest Priority

	Applied CY15	Applied Cumulative (FFY04-15)
Gross Erosion Before	543.0	656.0 Tons/yr.
Gross Erosion After	311.0	336.0 Tons/yr.
Gross Erosion Reduction	232.0	320.0 Tons/yr.
Sediment Delivery Before	293.0	318.0 Tons/yr.
Sediment Delivery After	16.0	17.0 Tons/yr.
Sediment Delivery Reduction	277.0	301.0 Tons/yr.
Phosphorus Delivery Before	982.7	1057.7 lbs/year
Phosphorus Delivery After	54.4	57.4 lbs/year
Phosphorus Delivery Reduction	928.3	1000.3 lbs/year
Total Acres Benefited	122.0	147.0 acres
Priority Acres Benefited	77	99 acres

Watershed Statistics (Completed + Planned)

Size: 6,682 Acres

Priority Acres: 1,048 Acres

Acres Benefiting: 231 Acres

Priority Acres Benefiting: 151 Acres

Approx. Sediment Del. Before Projects (Watershed): 7,169 Tons

Approx. Sediment Del. After Projects (Watershed): 7,491 Tons

Approx. Sediment Del. Reduction (Watershed): 382 Tons

Average Sediment Del. Reduction Per Acre: 1.55 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 26,121 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 24,370 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 1,391 Lbs.

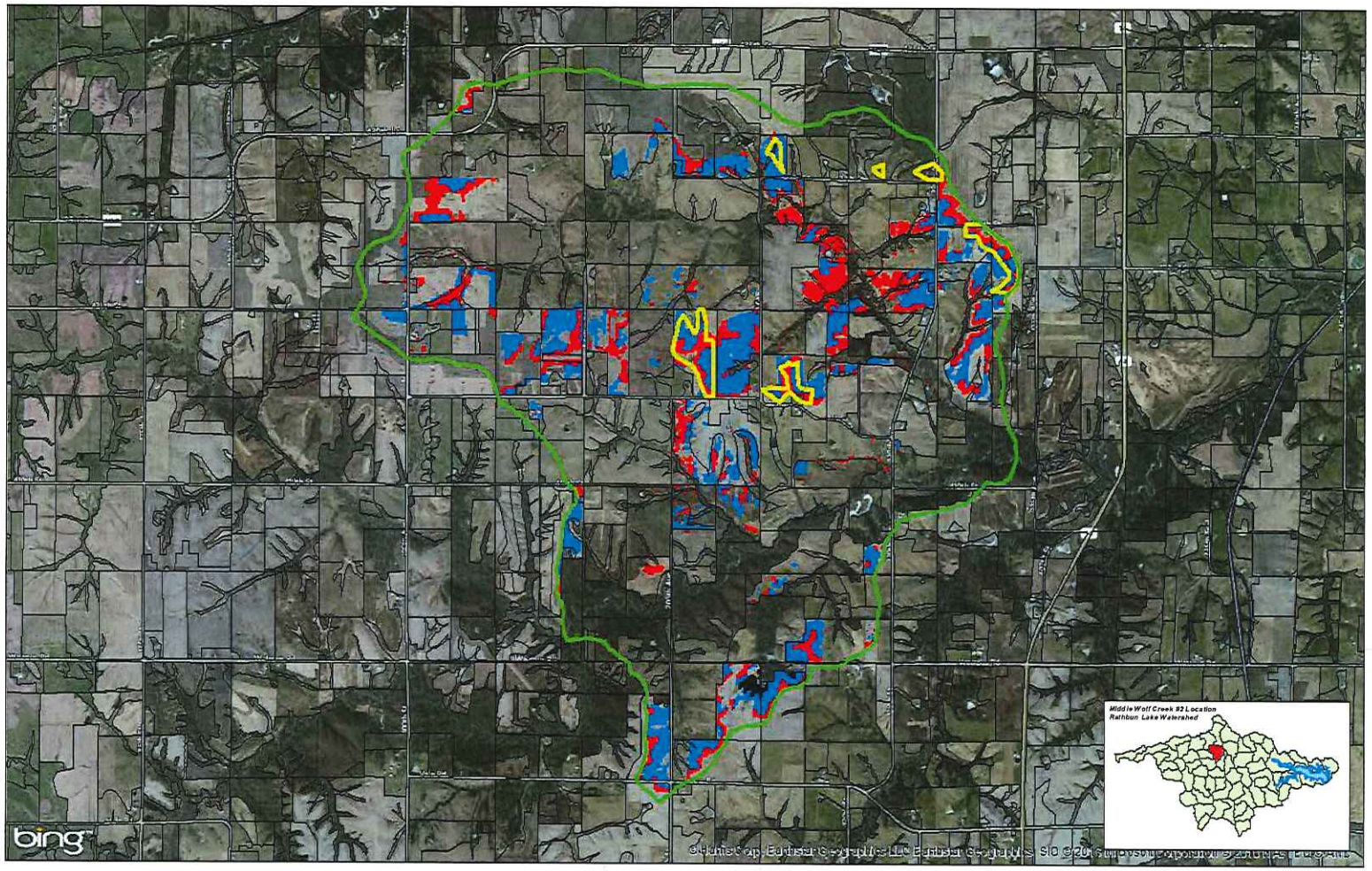
Average Phosphorus Del. Reduction Per Acre: 6.02 Lbs./Acre

0 0.125 0.25 0.5 Miles

Source: Rathbun Land and Water Alliance
IDALS DSC
BingMaps
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association

Middle Wolf Creek #2 Sub-Watershed
Priority Land Areas



Legend
- Watershed Boundary
- Project Work Areas
- Status
  - Completed
  - Planned
- Field Boundaries
- No Priority
- Priority
- High Priority
- Highest Priority

	Applied CY15	Applied Cumulative (FFY04-15)
Gross Erosion Before	195.0	447.0 Tons/yr.
Gross Erosion After	43.0	95.0 Tons/yr.
Gross Erosion Reduction	152.0	348.0 Tons/yr.
Sediment Delivery Before	87.0	193.0 Tons/yr.
Sediment Delivery After	2.0	4.0 Tons/yr.
Sediment Delivery Reduction	85.0	189.0 Tons/yr.
Phosphorus Delivery Before	408.0	937.1 lbs/year
Phosphorus Delivery After	9.4	18.8 lbs/year
Phosphorus Delivery Reduction	399.5	888.3 lbs/year
Total Acres Benefited	43.0	99.0 acres
Priority Acres Benefited	25	75 acres

Watershed Statistics (Completed + Planned)

Size: 5,868 Acres

Priority Acres: 864 Acres

Acres Benefiting: 99 Acres

Priority Acres Benefiting: 75 Acres

Approx. Sediment Del. Before Projects (Watershed): 7,159 Tons

Approx. Sediment Del. After Projects (Watershed): 6,970 Tons

Approx. Sediment Del. Reduction (Watershed): 189 Tons

Average Sediment Del. Reduction Per Acre: 1.91 T/Acre/Year

Approximate Phosphorus Del. Before Projects (Watershed): 34,356 Lbs.

Approximate Phosphorus Del. After Projects (Watershed): 33,468 Lbs.

Approximate Phosphorus Del. Reduction (Watershed): 888 Lbs.

Average Phosphorus Del. Reduction Per Acre: 8.97 Lbs./Acre

0 0.125 0.25 0.5 Miles

Source: Rathbun Land and Water Alliance
DALS DSC
Bing Maps
USDA FSA

Prepared By: Tyler J. Jacobsen, Rathbun Regional Water Association